We have used the test in several cases of hydatidiform mole, beginning shortly after Aschheim, in March, 1930, calling attention to the fact that the urine of patients with such complications gave a very much stronger Aschheim-Zondek reaction than did that from women with normal pregnancies. We have had several cases which corroborated this statement. Yet the clinician should remember that although the test usually becomes negative a comparatively short time after the extrusion of the mole, it may remain positive as long as two months thereafter without the presence of chorio-epithelioma. In one of our cases the reaction was negative nine days after the mole was removed from the uterus. Eberhardt, however, found it was positive with undiluted urine for thirty-six days in one of his patients, and in forty-two days in another. In November, 1930, the test proved consoling to us when treating a patient with hydatidiform mole who bled considerably for one month after removal of the tumor. Immediately after the operation the test was positive for mice with one-eighth of one cubic centimeters of urine in three days (Aschheim-Zondek technique) as opposed to the normal pregnancy reaction then obtained with one cubic centimeters of urine in four days. A month later we found two large ovarian cysts (lutein) in the abdomen that were not present at the time when we removed the tumor. Since the patient was bleeding, we curetted without finding syncytial elements, yet because she was forty years of age and had had several children, to be on the safe side we inserted a small dose of radium to spray completely the uterine cavity. Ten days later the Aschheim-Zondek test was negative both for mice and with the concentrated method for rats. In the light of present knowledge, we would not use radium in treating such a patient today.

Quite recently there has been in one of the University Medical School Hospital services a most perplexing case. In March the patient was delivered of a mole. Two weeks later the Friedman test for pregnancy was positive, using ten cubic centimeters of undiluted urine, and then on May 2, May 16, and on August 27 it was still positive, even when using ten cubic centimeters of urine diluted 1:50 and 1:100 times. This long continuation of a very strong pregnancy reaction, together with some bleeding, seemed to indicate the presence of a chorio-epithelioma. The woman consequently was curetted without such findings. Feeling that this reaction, continued for more than four months, demanded more careful investigation, the abdomen was opened without finding evidence of tumor. Two weeks, and three weeks thereafter the reaction was negative, using ten cubic centimeters of 1:100 solution of urine. While there is always the possibility that the curette may fail to give the diagnosis, even though the tumor may be present, as in the case reported by Browne, the negative Aschheim-Zondek reaction indicates that at present there is neither trophoblastic tissue nor tumor. At any rate, the woman seems well and is symptom-free. This case will be reported later in detail.

Within the last few weeks the Aschheim-Zondek reaction has aided us in diagnosing an ectopic pregnancy. This patient's July period came a few days early; then she bled normally from August 21 to 26, bleeding returning August 29 to September 2, without pain or distress. On September 6 she had several attacks of cramping pain which continued off and on for a couple of days but which was relieved by taking aspirin. In all, she had but four such crampy attacks which were later replaced by pain running down her thigh. She applied to my service on September 12, having a small right tubal mass. At this time an Aschheim-Zondek test was positive. We tentatively diagnosed an early tubal abortion which did not seem confirmed by the blood picture when she entered the hospital on Septmber 18, when the red blood count was normal, the white blood cells were 7720, with 67 per cent of polymorphic leukocytes. The blood sedimentation time was three hours and twenty-minutes. Yet operation on the following day proved the tentative diagnosis was correct. The Aschheim-Zondek test was positive on the day of operation, and seven days later, but was negative two weeks after operation. While the specimen presented grossly only as a tubal abortion, microscopic study disclosed several small areas of chorionic villi still firmly attached to the walls of the tube in a few places.

The use of this diagnostic aid suggests a wider field for application. The reaction, supposedly due to living chorionic villi, may be due only to the fetal epithelium as is suggested by Eberhardt's case of chorio-epithelioma in which only remote metastases were found without the uterine tumor. It well may be that the varying strengths of the test may prove useful in the event patients with normal pregnancy may have unduly large amounts of syncytial cells in the lung and liver which cause such symptoms as hyperemesis or other toxemias of pregnancy which at present remain as unsolved problems.

Doctor McNeile's paper is timely and presents a critical review of the literature which should be of interest to any advanced student in obstetrics.

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H. A. Stephenson, M.D. (490 Post Street, San Francisco).—Doctors McNeile and Reynolds have surely given us a complete résumé of the literature on this subject. Since it is becoming increasingly necessary to make a positive and early diagnosis of pregnancy we are coming more and more to rely on the Friedman test. We agree with Doctor McNeile that it would be much wiser to have the urine collected from the patient by a nurse so that we may be absolutely sure that the specimen is the proper one. We have not taken this precaution in the past, but shall do so in the future. We have had no experience with the technique of the test as we have depended upon reliable laboratories. Done in this way the test has been in our practice 100 per cent successful.

WASSERMANN-FAST SYPHILIS*

By Merrill W. Hollingsworth, M. D.
Santa Ana

Discussion *by Samuel Ayres, Jr., M. D., Los Angeles; Donald A. Charnock, M. D., Los Angeles; Hermann Schussler, Jr., M. D., San Francisco.*

THE term "Wassermann-fast" is given to a case of syphilis that still shows a positive Wassermann reaction after having been treated over a period of three or more years by ordinary chemotherapeutic methods. This includes any combination of the arsphenamins, bismuth, mercury, and the iodids. For the purpose of this paper we will consider only those cases in whom all clinical manifestations of syphilis have been arrested, and we will also exclude cases of paresis.

SIGNIFICANCE OF THE WASSERMANN-FAST REACTION

Following our best interpretation of the Wassermann reaction we find it is supposed to be positive when certain enzymes are circulating in the blood. These enzymes result from the antigenic action of certain foreign lipoid-protein mixtures or compounds, such as the bodies of dead spirochaetes. The spirochaete multiples by simple fission and if its environmental conditions are favorable the spirochaete does not ever need to die. In conditions where no spirochaetes are being

* Read before the General Medicine Section of the California Medical Association at the sixty-first annual session, Pasadena, May 2-5, 1932.

killed we would expect to find a negative Wassermann reaction. We do find such reactions in congenital syphilis during the first two months after birth and in malignant syphilis. In both these conditions the proliferation of the spirochaete is unabated. When death of some of the spirochaetes begins to take place the Wassermann reaction becomes positive. Although the actual mechanism of the Wassermann reaction is known to differ from the purely immunological reaction of a Widal test a positive Wassermann test does seem to mean that the parasites are still being killed within the body of the host. If spirochaetes are still being killed the host is still potentially a case of clinical syphilis. This leads us to the inference that we should never entirely cease some kind of antiluetic treatment in a patient with a persistently positive Wassermann reaction. The reaction is considered persistent if still positive in not less than six months after treatment has ceased.

Why does the chemotherapeutic program sometimes fail with the resultant production of the Wassermann-fast group? How does this group differ in clinical pathology from the easily cured group? It is commonly known that cases of syphilis exhibiting the typical skin lesions but rarely become cases of neurosyphilis or cases of Wassermann-fast syphilis, even with indifferent treatment. The occurrence of the efflorescence in some way apparently builds up a degree of resistance in the host that gives chemotherapy sufficient support to effect a complete eradication of all spirochaetes. Kyrle [1] made use of the resistance-building factor of the skin in Finger's clinic in Vienna by inoculating cases of Wassermann-fast cerebrospinal syphilis with fresh spirochaetes taken from chancres on other patients. Inoculations were made on the upper arm and a gumma produced. The production of even this skin lesion gave sufficient biological support to chemotherapy to render the blood and spinal fluid Wassermann negative and the lesion itself easily cleared up during the process. Later he tried, with some degree of success, to accomplish the same result with injections of a gelation called mirion.

WEAKNESS OF THE ARSPHENAMINS

The arsphenamins are excellent spirochaeticides, provided the spirochaetes can be exposed to their action. In early syphilis, when the disease is a blood-stream infection, the arsphenamins represent the machine-guns that with a sudden spurt mow down an enemy coming over the trenches. But after the enemy has dug in we have a different problem. The arsphenamins find themselves fixed or exhausted on some kinds of visceral tissue and especially on nerve tissue before reaching the spirochaete imbedded therein. Nerve tissue and spirochaete are both lipoids, and the arsphenamins are a series of lipoid dyes. This shielding action of some visceral tissues, especially nerve tissue, coupled with their lack of resistance-building factors, makes a good setting for the development of the Wassermann-fast case in cases where skin lesions were never present. Further efforts to improve the arsphenamins would seem futile; what we need is an entirely different approach. Here we can use bismuth, the patient and persistent sniper that stays on the job hour after hour, every day in the month, ready to kill any of the enemy that stick their heads above the trenches. But what collateral measures can we use to substitute for skin lesions in getting the enemy out of the trenches?

NONSPECIFIC STIMULATION THERAPY

In casting about for some means with which to try to alter the Wassermann-fast patient's reaction we may first study the effect of malarial therapy on paresis. Paresis, we all know, with its strongly positive Wassermann on both the blood and spinal fluid, is most refractory to ordinary chemotherapeutic treatment. But after malarial inoculation, when properly combined with chemotherapy, a very large percentage of paretics show a negative fluid and a somewhat smaller percentage a negative blood reaction. The mechanism of malarial therapy has been studied and explained by Joseph Schumacher.[2] Inasmuch as this concerns our treatment of the Wassermann-fast case we will review it here. He demonstrated that the parenteral injection of lipoids stimulates the proliferation of lipolytic enzymes. Likewise the injection of foreign proteins produces proteolytic enzymes. The simultaneous but separate injection of these two antigens in the same animal body causes the formation of the two enzymes separately. Although these two enzymes may exist concurrently in the same patient they exhibit no lytic action on a lipoprotein. This requires a third member, the lipoproteolytic enzyme. But if the lipoid antigen and the protein antigen are simply mixed together before injection, the third enzyme is produced, namely, a lipoproteolytic enzyme. The enzyme is nonspecific biologically or as an immune body, but is very specific chemically; that is, the enzymes produced by injecting a mixture of lipoids and proteins derived from plants will show a lytic action on lipoproteins of animal origin. The body of the spirochaete, being a lipoprotein, stimulates the proliferation of these lipoproteolytic enzymes when it is killed within the body of the host. These enzymes have a lytic action on the syphilitic lesions including possibly some direct spirochaeticidal effect. In malarial therapy the disintegrating red blood cells plus the dead plasmodia following quinin furnish excellent antigenic lipoproteins. The enzymes resulting can permeate the visceral and nerve tissue and expose the imbedded spirochaetes to our chemotherapeutic drugs—besides having some direct effect of their own. But malarial therapy, assuming for the moment it to be the treatment for Wassermann-fast syphilis, is too inconvenient to be used in the ambulant office case of ordinary syphilis. The analysis of its action, however, suggests that the parenteral injection of a lipoprotein might give an equivalent result not only for paresis but for Wassermann-fast cases.[3] Hardesty applied Schumacher's conclusions to the treatment of seventy-five luetics in all stages. His lipoprotein injection was made up from the antigen used in the Wassermann test

plus milk. Although clinical results were excellent, owing to his use of a Wassermann antigen, his cases showed a slow return to negative. However, it is not necessary to combine a Wassermann antigen with milk, as milk alone offers a convenient, easily obtainable lipoprotein. Many references to its use have been accumulating since 1917. It has been given a position but slightly inferior to malarial treatment by numerous investigators. In 1927, I [4] reported its use in my experience and since then have found it to be very effective in prophylaxis and treatment of Wassermann-fast cases. A point to remember is that the injection of the milk itself is sufficient frequently to cause a positive Wassermann reaction, so one does not expect a negative reaction until six months have elapsed after the last injection. Boiled skimmed milk is used, intramuscular injections of 2, 4, 6, and 8 milligrams successively, being given at weekly intervals while administering some salt of bismuth to a total of 2.0 gram. Since the Wassermann-fast case has already been very well treated with the arsphenamin series, I believe the more continuous action of bismuth better suited to treatment of such a case. In early syphilis, intramuscular injections of milk (total of four to six doses) are given during the first course of bismuth. In late cases milk and bismuth alone are used. If necessary such a course of twelve injections of bismuth and four injections of milk may be repeated after a year. This form of therapy has been very successful in my experience in cases where there has been no question of paresis.

REPORT OF CASE

A surgeon referred to me his sister-in-law on whom he had operated for uterine fibroids. Failure of the wound to heal properly led him to have a blood Wassermann test made. This was four plus. Then it was discovered that the patient's divorced husband had contracted syphilis while still living with her. The surgeon found no other evidence of lues in the patient besides the failure of the wound to heal and the positive Wassermann test. He at once instituted the most vigorous treatment, using 0.9 gram dosages of neoarsphenamin in courses of twelve weekly injections with alternating courses of mercury rubs. After three years of such treatment, with practically no rest periods, the patient still had a four plus blood Wassermann but a negative spinal fluid reaction. A rest period of twelve months was advised and the blood Wassermann was still four plus. Six weekly injections of 0.2 gram bismuth salicylate were given, and with the first four injections 2, 4, 6, and 8 milligrams of aolan were given in the opposite buttock. Six months after the last injection of bismuth the blood Wassermann reaction was negative. The course will be repeated after another rest period of twelve months.

CONCLUSIONS

1. The persistently positive Wassermann reaction means potential recurrence of clinical syphilis.

2. Treatment should not be stopped altogether on Wassermann-fast syphilis.

3. A program of treatment is suggested, employing nonspecific stimulation therapy in conjunction with administration of bismuth.

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DISCUSSION

SAMUEL AYRES, JR., M. D. (2007 Wilshire Boulevard, Los Angeles.)—If the question were asked whether it was more important to treat a case of clinically active syphilis showing a negative Wassermann, which not infrequently occurs late in the disease, or a case of clinically inactive syphilis with a persistently positive Wassermann, I think all would agree that the former was more deserving of treatment. Again, might it not be preferable to live twenty-five years longer with clinically negative Wassermann-fast syphilis than to die twenty years sooner from an overdosage of medication in an effort to render the blood negative.

The essayist has assumed a highly commendable attitude of conservatism in handling this dilemma. Until our knowledge of biochemistry is greater than it is now, we must assume that a persistently positive Wassermann reaction is a potential source of danger. On the other hand, it would seem unreasonable to run the risk of shortening one's life by excessively vigorous chemotherapy on top of an ordinarily adequate amount of treatment.

Nonspecific therapy seems to offer a choice which is often effective without being drastic. In addition to the milk injections which have been mentioned, another procedure was suggested by Wernick[1] and later by Beinhauer and Jacob,[2] namely, the intravenous injections of sodium thiosulphate. The mode of action of this drug in Wassermann-fast syphilis is not definitely known. In cases of metallic poisoning, such as arsenic poisoning, it is thought to be effective by combining with the metal which has formed an insoluble compound with tissue proteins, producing a new soluble compound which then can be excreted in the urine. Many observations in cases of arsenic poisoning where an increased arsenic excretion follows the injection of sodium thiosulphate would tend to substantiate this hypothesis. It is conceivable then that the action of sodium thiosulphate in Wassermann-fast syphilis might be due to the formation of therapeutically active soluble compounds with metals which had been stored in the tissues in an unavailable form. On the other hand, its action may be more in the nature of a nonspecific effect.

One patient may be cited in whom the administration of sodium thiosulphate marked the turning point in a persistently positive Wassermann. It is, of course, impossible to say whether the change was a matter of cause and effect or merely coincidence. Mr. P., age about forty-five, was first seen with symptoms of early tabes dorsalis: diplopia, Argyl-Robertson pupils, absent knee-jerks, and genital impotence. The blood Wassermann reaction was four plus. In spite of prolonged treatment with alternating courses of neoarsphenamin, mercury, various types of bismuth, iodids, and triparsamid, the Wassermann remained persistently positive for six years, giving four-plus reactions except on three occasions, when it gave a three-plus reaction. The last test before beginning sodium thio-

1 Wernick, R.: Hyposulphite of Soda in the Treatment of Mercury and Arsenic-Fast Syphilis, Am. J. Syph., 9: 563 (July), 1925.

2 Beinhauer, L. G., and Jacob, F. M.: Sodium Thiosulphate in Wassermann-Fast Syphilis, Am. Jour. Syph., 12: 61 (Jan.), 1928.

sulphate was four plus. Eight intravenous injections of sodium thiosulphate were given on an average of a week apart, most of the injections being of one gram. No blood test was taken immediately at the conclusion of these injections and the patient was not seen again for five months. At this time a Wassermann performed in the same laboratory as the preceding tests was only two plus. The patient did not report again for a year. At this time a Wassermann was not taken, and although he was feeling in excellent condition, he was given ten injections of bismuth, but another blood test was not taken for another nine months, at which time it was only one plus. Since then the patient has been on conservative treatment, consisting of a course of ten injections of bismuth each year. During this time all blood tests have been negative except once three years ago, when a single four-plus reaction was obtained.

In other words, for over six years prior to a series of injections of sodium thiosulphate, the Wassermann test was either three or four plus in spite of vigorous treatment of various types; after the injections of sodium thiosulphate for a like period of six years the blood tests have all been negative except for one two-plus, one one-plus, and one four-plus reaction. A spinal puncture two years ago was also negative.

This case is apparently corroborative of the results obtained by Beinhauer and Jacob in a series of thirty-eight cases of Wassermann-fast syphilitic cases. Eighty-five per cent were serologically improved after a course of sodium thiosulphate intravenously, and thirty-five per cent of the cases became Wassermann-negative and remained so for periods of more than one year wlthout any further antiluetic treatment.

It would seem that the various methods of nonspecific therapy deserve serious consideration in the handling of Wassermann-fast cases. On the other hand, it does not mean that the problem is necessarily finished as soon as the Wassermann reaction becomes negative in these cases. Short courses of specific therapy, such as bismuth, given about once a year might be considered as good life insurance.

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Donald A. Charnock, M. D. (523 West Sixth Street, Los Angeles).—The Wassermann-fast patient presents an important problem. We are still in doubt as to the mechanism of the shift from the normal in the complement-fixation test. Some observers hold that such persistent reactions are an inherent property of the serum and in no way indicate a syphilitic focus (Kilduff: Clinical Interpretation of Blood Examinations, L. and F., 1931). Other equally sincere investigators emphasize that necropsy shows such cases to have a high percentage of cardiovascular, neurological or visceral lesions (Fordyce, Am. J. Med. Sci., Vol. 166, p. 3, 1923, and Stokes and Burman, Am. J. Med. Sci., Vol. 160, p. 584, 1920).

While we are philosophizing about this problem we too often forget the patient. We have taught him that a positive Wassermann means syphilis. He is not greatly impressed by our academic discussion when he knows that his blood is still "two plus." Whatever may be our feeling about his case it is our duty to use whatever means we have available to control what is potentially an active infection.

The rôle of the nonspecific agent seems to be that of a catalyzer which increases the potency of the spirocheticide. In this way a response is obtained which often reduces the serum reaction to a negative phase.

At the suggestion of Doctor Hollingsworth we have for several months been using the nonspecific milk injections. Aolin has been used for convenience. This has been given in conjunction with active treatment.

While it is yet too early to quote statistics we have already had one very stubborn Wassermann-fast case show a negative reaction.

In using this method it should be understood that the milk injections are not being used as a form of "protein shock" treatment. The introduction of the milk increases the lipoprotein content of the individual's blood and thus stimulates the lipoproteolytic enzyme.

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Hermann Schussler, Jr., M. D. (384 Post Street, San Francisco).—The problem of the clinically latent case of syphilis, with persistently positive serology, has been a challenge to syphilologists ever since the introduction of the Wassermann test. Hypotheses as to the significance of Wassermann-fastness have ranged from Wile's conception of a "scar" persisting after actual cure, to the belief that hidden active lesions are always present. Certainly there are many patients who carry a positive Wassermann for the remainder of their long lives without a clinical relapse, and others who succumb rapidly to injudicious therapeutic attempts to reverse their apparently harmless positive readings. On the other hand, the disquieting frequency with which we find visceral syphilitic lesions at autopsy in clinically latent Wassermann-fast patients, makes us wonder how many of these would have developed clinical aortitis or hepatitis if they had lived longer. It is assumed for the purpose of this discussion that patients with positive spinal fluids are classified as cases of "asymptomatic neurosyphilis" rather than Wassermann-fastness, and that all clinical evidence of syphilis is absent.

Many methods have been suggested for rendering the fixed positive Wassermann negative. A partial list of these would include: (1) nonspecific protein therapy; (2) lipoprotein therapy with bismuth (Hollingsworth; (3) sodium thiosulphate, with or without subsequent specific treatment; (4) silver salvarsan or old arsphenamin when neoarsphenamin has been used; (5) bismuth when mercury has been used, and vice versa; (6) colloidal mercury sulphid; (7) giving mercuric chlorid and other mercurials intravenously; (8) intravenous sodium iodid injections; (9) radical removal of focal infections; (10) correction of functional disturbances, such as hypothyroidism or achylia gastrica.

In every one of these procedures there are a certain number of successes to its credit, as shown by the statistics of its proponents, but none of them is effective in all cases. Hence it is often necessary to try several in succession, giving each a fair trial before abandoning it. The simplest and least dangerous should of course be used first. Sodium thiosulphate is more likely to succeed in patients who are saturated with heavy metals, so that a minute additional dose of mercury or bismuth will precipitate a stomatitis. Here a course of twenty doses of one gram of the freshly dissolved crystals in ampoules, given twice a week, will purge the body of its deadweight of inert heavy metal. After a suitable rest period, one may then start afresh.

I have had no experience with Doctor Hollingsworth's technique, and would like to ask him whether he prefers milk to aolan or ommadin, and whether there is any objection to a longer course than six injections, or to the use of full doses from the start.

I feel that focal infections often tend to keep a Wassermann test positive, and that their removal is often followed by serological reversal without other treatment. It must always be remembered, however, that a fixed positive sometimes becomes negative after a year or two of complete rest from all treatment. Recently I have been using colloidal mercury sulphid in these cases, giving two or three cubic centimeters twice a week for six months, with occasional brief rests, as advocated by Wilhelm Gennerich of Kiel. The Wassermann response has been quite favorable, and the intramuscular injections are painless and well borne. Dr. M. J. Freeman has given over sixty thousand injections in the Chicago Board of Health clinic, and writes me that he has obtained 25 per cent of permanent serological reversals in Wassermann-fast cases. Perhaps this preparation might be even more effective than bismuth salicylate when milk injections are used.

In closing, a few philosophical comments may be in order. Why are we so anxious to reverse a fixed positive Wassermann? Is it to satisfy the patient, or do we ourselves feel a haunting twinge of conscience in the matter? If a brief course of the new procedure accomplishes the reversal (*e. g.,* a few doses of milk and bismuth, or of sodium thiosulphate, or of colloidal HgS.), can we seriously maintain that the underlying visceral lesion, which we assume to be present and responsible, has *thereby* been permanently extinguished? When a modern syphilologist finds, in the treatment of an early secondary case, that the Wassermann has become persistently negative after the first course, he does not stop treatment and congratulate the patient on his good fortune, but silently proceeds without rest periods for at least another year. Nor does he shorten the treatment of a tertiary ulcer or a visceral lesion because the patient has never shown a positive Wassermann while under observation. Most of us would do well to reflect occasionally on Hans Lisser's succinct observation, "A negative Wassermann test means exactly nothing." In our frantic attempts to obtain this result in a clinically cured patient, are we not often pursuing a will-o'-the wisp?

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Doctor Hollingsworth (Closing).—Although I fully appreciate the question raised whether we are treating a patient or his laboratory report, I do believe for the reasons I stated that a patient is not cured but still needs treatment if his Wassermann or Kahn test is persistently positive.

I am very pleased to hear Doctors Ayres, Charnock, and Schussler agreeing with my statement that what the Wassermann-fast patient needs is *different,* rather than simply *more* treatment. Changing the type of arsphenamin has given me no satisfaction. In fact I am almost beginning to believe the importance of the arsphenamins in the treatment of late syphilis has been greatly exaggerated. I am unable to discuss sodium thiosulphate because of no experience. We practically always limit the number of lipoprotein injections to four because we fear the production of anaphylaxis, and four seems adequate. Aolan produces less local reaction and has been preferred lately in office practice. We had but one reaction from milk in five years in two large clinics, then had two the same day and a third within the same week. Subsequent investigation led me to believe they were injected into a blood vessel. All four reactions occurred within two minutes after the second injection before the patient could get out of the treatment room and, though severe, very readily responded to adrenalin, ephedrin, and atropin.

PEPTIC ULCER—ITS CLINICAL ASPECTS*

REPORT OF CASES

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Discussion *by Franklin R. Nuzum, M. D., Santa Barbara; Fred H. Kruse, M. D., San Francisco; Grant H. Lanphere, M. D., Los Angeles.*

Sippy stated that peptic ulcer was one of the most common diseases of a serious nature that the medical man is called upon to treat. The Mayos' pathologic and surgical statistics show that ulcer is common to 12 per cent of the race. In a city the size of Pasadena there may be 8,400 ulcer cases. Many go untreated, some heal without treatment, and many do not heal with treatment. More would heal better and more permanently if the digestively upset patient would present himself earlier for examination. If people would pay more attention to their insides and less to their outsides, many more ulcers would be found and cured and many cancers discovered earlier.

COMMENTS ON ETIOLOGY, SYMPTOMS, AND TREATMENT

Although the etiology of ulcer is unknown (Alvarez) we must respect the probable causes, such as foci of infection of the nasal accessory sinuses, and teeth; arteriosclerosis, trauma, allergy, mechanical irritation, nervous worry, unhappiness, syphilis, and other systemic infections. Where any of these etiologic factors exist, they should be removed at once. Also search should be made for pathology in the portal lymphatic system, as a source of the cause of ulcer, and if any such be present it should be removed.

The symptoms of peptic ulcer are well known. These vary according to the type, location, age of the ulcer, and the complications that may be present. The clinical symptoms of ulcer may be masked by the associated pathology that may be present.

Properly to treat peptic ulcer, due consideration must be given to these varying symptoms and possible associated pathology. The complications which demand surgery are: perforation, perigastric adhesions, perigastric abscess, hour-glass stomach, obstruction of high grade due to scar-tissue formation, suspicious possible malignant degeneration. Simple ulcers without complications, and those with such complications as obstruction due to spasm, inflammatory swelling and edema, and the vast majority of the cases of hemorrhage, should be treated medically. Penetrating ulcers of the lesser curvature and duodenum yield readily to proper medical treatment. (See Figs. 1, 2, and 3.)

A knowledge of the possibilities and probabilities calls for a complete history, thorough physical examination, and the proper laboratory tests. With this evidence at hand, it is then necessary to have the patient radiographed. The x-ray will not only aid in telling whether or not an ulcer is present but it will also tell us the location of the ulcer, its type, and a clew to its complications. It will aid in diagnosis of cancer by the definite finger-print markings, which are easily read.

However, there are certain types of ulcer that the x-ray misses. These are the simple types of ulcer without complications and without any definite changes in the wall of the stomach. Many of these ulcers exist in the stomach, and should be treated before they present x-ray evidence of their existence. As a matter of fact, the x-ray should be used to confirm or reject the original diagnosis only when it is used in connection with other findings in the case. In other words, do not forget common sense when using a special sense.

Another type of ulcer that gives misleading findings under x-ray is the stenosing type. Many times in true obstruction the barium-meal mixture will be *forced* out of the stomach by the hyperperistalsis; and then again we may have *delay* in

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